**3GPP TSG-WG1 Meeting #102-e *R1-2007434***

**E-meeting, August 17 – 28, 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **38.213** | **CR** | **0131** | **rev** | **-** | **Current version:** | **16.2.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | CR on correction on uplink power sharing for DAPS HO |
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| ***Source to WG:*** | Moderator (Intel Corporation) |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | NR\_Mob\_Enh-Core |  | ***Date:*** | 08-31-2020 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | (1) Current specification allows DAPS HO between FR2 and FR2 cells, which is unsupported by RAN4 specification.(2) incorrect use of RRC parameter names in specification(3) power sharing behavior for uplink DAPS is incorrect(4) uplink transmission cancellation to handle Msg 3 transmission is missing |
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| ***Summary of change:*** | (1) Clarify that for FR1 and FR2 DAPS HO, power control is performed independently, and for FR1 and FR1 DAPS HO, power control is performed based on existing described UE behavior(2) Correct all incorrect RRC pameter names in section 15(3) Specify that for intra-frequency DAPS, UE drops and cancels source cell transmission when source and target cell transmission overlap, for inter-frequency DAPS,* If the UE does not supports uplink transmission cancellation, and no power sharing mode is enabled, UE does not expect simultaneous transmision between source and target to happen
* If the UE does supports uplink transmission cancellation, and no power sharing mode is enabled, UE drops and cancels source cell transmission when source and target cell transmission overlap,

For all other case, UE follows the power sharing configuration for transmission to source and target cell.(4) add the description to state UE is not expected to cancel Msg 3 transmission if gap between RAR grant and PUSCH transmission is less than specified value. |
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| ***Consequences if not approved:*** | (1) inconsistency between RAN1 and RAN4 specification on DAPS supported frequency ranges(2) incorrect specification with wrong RRC parameter references(3) uplink DAPS HO feature will be broken and incomplete(4) UE may be required to process DCI and RAR grant faster than what is typically allowed by modern modem design, and could lead to not supporting DAPS HO to avoid this issue. |
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| ***Clauses affected:*** | 15 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** | **Isolated Impact Analysis:**UE that has implemented this CR connected gNB that has not implemented this CR:* gNB may configure unsupported configuration of uplink transmissions during DAPS HO and result in undefined UE behaviors that can result in HO failure.

UE that has not implemented this CR connected to gNB that has implemented this CR:* gNB cannot expect correct behavior for uplink transmission during DAPS HO and undefine UE behavior may show up during DAPS HO, resulting the HO failure.
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| ***This CR's revision history:*** |  |

# 15 Dual active protocol stack based handover

If a UE indicates a capability for dual active protocol stack based handover (DAPS HO), the UE can be provided with a source MCG and a target MCG.

If a UE is configured with an target MCG using NR radio access in FR1 or in FR2 and with a source MCG using NR radio access in FR2 or in FR1, respectively, the UE performs transmission power control independently per cell group as described in Clauses 7.1 through 7.5.

If a UE is configured with a target MCG using NR radio access in FR1 and a source MCG using NR radio access in FR1, the UE is configured a maximum power for transmissions on the target MCG by *p-DAPS-Target-r16* and a maximum power for transmissions on the source MCG by *p-DAPS-Source-r16* and with an inter-CG power sharing mode by *uplinkPowerSharingDAPS-Mode-r16*. The UE determines a transmission power on the target MCG and a transmission power on the source MCG per frequency range.

If the UE indicates support for semi-static power sharing mode1and is provided *uplinkPowerSharingDAPS-Mode-r16* = *Semi-static-mode1*, the UE determines a transmission power for the target MCG or for the source MCG as described in Clause 7.6.2 for *nrdc-PCmode-FR1-r16* = *Semi-static-mode1* by considering the target MCG as the MCG and the source MCG as the SCG.

If the UE indicates support for semi-static power sharing mode2 and is provided *uplinkPowerSharingDAPS-Mode-r16* = *Semi-static-mode2*, the UE determines a transmission power for the target MCG or for the source SCG as described in Clause 7.6.2 for *nrdc-PCmode-FR1-r16* = *Semi-static-mode2* by considering the target MCG as the MCG and the source MCG as the SCG. The UE expects to be provided *uplinkPowerSharingDAPS-Mode* = *Semi-static-mode2* only for synchronous DAPS HO operation [10, TS 38.133].

If the UE indicates support for dynamic power sharingand is provided *uplinkPowerSharingDAPS-Mode-r16* = *Dynamic*, the UE determines a transmission power for the target MCG or for the source MCG as described in Clause 7.6.2 for *nrdc-PCmode-FR1-r16* = *Dynamic* by considering the target MCG as the MCG and the source MCG as the SCG.

If

- the carrier frequencies of target MCG and source MCG are not intra-frequency, and

- the UE does not indicate support of ul-TransCancellationDAPS-r16, and

- UE does not indicate a capability for power sharing between source and target MCG in DAPS handover or the UE is not provided with uplinkPowerSharingDAPS-Mode-r16,

the UE does not expect transmissions on the target and source cell in overlapping time resources.

If

- the UE indicates support of ul-TransCancellationDAPS-r16, and

- the carrier frequencies of target MCG and source MCG are not intra-frequency, and

- UE does not indicate a capability for power sharing between source and target MCG in DAPS handover or the UE is not provided with uplinkPowerSharingDAPS-Mode-r16, and

- UE transmissions on the target cell and the source cell are in overlapping time resources,

the UE transmits only on the target cell, and cancels the transmission to source cell

If

- the carrier frequencies of target MCG and source MCG are intra-frequency, and

- UE transmissions on the target cell and the source cell overlapping time resources,

the UE transmits only on the target cell and cancels the transmission on the source cell.

The UE does not expect to cancel a transmission on the source cell if a first symbol of the transmission on the source cell is less than after a last symbol of a CORESET where the UE receives a PDCCH providing a DCI format scheduling a transmission on the target cell. is the PUSCH preparation time for the corresponding PUSCH processing capability [6, TS 38.214] assuming , is a time duration corresponding to 2 symbols for SCS configuration , and is the smallest SCS configuration between the SCS configuration of the PDCCH providing the DCI format and the SCS configuration for the transmission on the source cell. If the UE transmits PRACH using 1.25 kHz or 5 kHz SCS on the source cell, the UE determines assuming SCS configuration .

A UE does not expect to cancel a transmission on the source cell in symbols from the set of symbols that occur, relative to a last symbol of a PDSCH reception conveying a RAR message with a RAR UL grant on the target cell, after a number of symbols that is smaller than msec, where is a time duration of symbols corresponding to a PDSCH processing time for UE processing capability 1 when additional PDSCH DM-RS is configured, is a time duration of symbols corresponding to a PUSCH preparation time for UE processing capability 1 [6, TS 38.214] and the UE considers that and correspond to the smaller of the SCS configurations for the PDSCH on the target cell and the transmission on the source cell. For , the UE assumes [6, TS 38.214].

The UE determines intra-frequency as described in Clause 9.2.1 of [10, TS38.133].

For intra-frequency DAPS HO operation, the UE expects that an active DL BWP and an active UL BWP on the target cell are within an active DL BWP and an active UL BWP on the source cell, respectively.

For DAPS operation in a same frequency band, a UE does not transmit PUSCH/PUCCH/SRS to the source MCG in a slot overlapping in time with a PRACH transmission to the target MCG or when a gap between a first or last symbol of a PRACH transmission to the target MCG in a first slot would be separated by less than symbols from a last or first symbol, respectively, of the PUSCH/PUCCH/SRS transmission to the source MCG in a second slot. For DAPS operation in a same frequency band, a UE does not transmit PRACH on the source MCG in a slot overlapping in time with a PUSCH/PUCCH/SRS transmission on the target MCG or when a gap between the first or last symbol of a PUSCH/PUCCH/SRS transmission on the target MCG is separated by less than symbols from a last or a first symbol, respectively, of a PRACH transmission on the source MCG. for or , for or , and is the SCS configuration of the active UL BWP for the PUSCH/PUCCH/SRS transmission.